



AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-10 (Canceled).

Claim 11. (Currently Amended): A non-linear inductor comprising:

a first stack of first laminations, said first laminations each having the same predetermined shape and at least one leg and at least one step at the end of said at least one leg a first leg with an edge and at least one other leg, said first legs forming a first leg portion of the first stack and said at least one other legs forming at least one other leg portion of the first stack, said first leg portion having an end formed by the edges of the first legs; and

a second stack of second laminations each having the same predetermined shape, said second stack of second laminations being disposed adjacent said first stack of first laminations to form a flow path for magnetic flux, said at least one step at said at least one leg end first leg portion of the first stack and said second stack of laminations creating cooperating to create an air gap that has two widths between said at least one the end of the first leg portion of the first stack and said second stack, said air gap having portions with different widths and being configured of laminations to produce a desired non-linear inductance characteristic for said non-linear inductor; and

a winding disposed around the first leg portion or the at least one other leg portion of the first stack.

Claim 12 (Currently Amended): The non-linear inductor of claim 11 wherein each of said first stack of laminations each have has an E shape each having and includes a center leg and end legs and said at least one leg having a step wherein the first leg is selected from said center leg or at least one of and the at least one other leg comprises said end legs.

Claim 13 (Currently Amended): A The non-linear inductor of claim 11,
comprising:

~~a first stack of laminations each having the same predetermined shape and at least one leg, wherein~~ a first predetermined number of said first laminations in said first stack having has a first predetermined length for said ~~one~~ first leg and a second predetermined number of said first laminations in said first stack ~~having~~ has a second predetermined length for said ~~one~~ first leg, said first and second predetermined lengths being different, and wherein the difference in lengths between the first and second predetermined lengths offsets the edges of the first predetermined number of the first laminations from the edges of the second predetermined number of the first laminations, thereby providing the end of the first leg portion with a stepped contour and forming the portions of the air gap with the different widths; and

~~a second stack of laminations each having the same predetermined shape adjacent said first stack of laminations to form a flow path for magnetic flux, said one leg and second stack of laminations creating an air gap that has at least two widths between said at least one leg and said second stack of laminations to produce a desired non-linear inductance characteristic for said non-linear inductor.~~

Claim 14 (Currently Amended): The non-linear inductor of claim 13 wherein said first predetermined number and said second predetermined number of said first laminations in said first stack are selected in a ratio to each other to produce a desired inductance characteristic for said non-linear inductor.

Claim 15 (Currently Amended): The non-linear inductor of claim 13 wherein said first predetermined number and said second predetermined number of said first laminations in said first stack are arranged in an order with respect to each other to produce a desired inductance characteristic for said non-linear inductor.

Claim 16 (Currently Amended): The non-linear inductor of claim 13 wherein each of said first ~~stack of~~ laminations ~~each have~~ has an E shape ~~each having and includes~~ a center leg and end legs and ~~said at least one leg in said first predetermined number of said laminations having a first predetermined length is selected from wherein said first leg is said center leg or at least one of~~ and said at least one other leg

~~comprises said end legs and said at least one leg in said second predetermined number of said laminations having a second predetermined length is selected from said center leg or at least one of said end legs.~~

Claim 17. (Currently Amended) A non-linear inductor comprising:

~~a magnetic material tape wound toroidal core;~~ body having first and second sections, said first section having a stepped end and comprising a stack of laminations of magnetic material, said stepped end of the first section being separated from the second section so as to form a stepped air gap therebetween, said air gap comprising a first step portion with a first width and a second step portion with a second width, said first and second widths being different; and

~~and an air gap in said core having at least two widths~~

a winding disposed around at least a portion of the first section of the magnetic body.

Claim 18 (Currently Amended). The non-linear inductor of claim 17 wherein the air gap further comprises a third step portion having the first width, wherein the body comprises magnetic material tape wound into a toroid, wherein the laminations comprise portions of the tape, and wherein said core body is cut in an axial direction to produce said air gap, said air gap having a first width and third step portions being disposed adjacent the edges of said toroidal-core toroid, respectively, and a said second width step portion being disposed between said first widths and third step portions.

Claim 19 (Original): The non-linear conductor of claim 18 wherein said first width is greater than said second width.

Claim 20 (Currently Amended): The non-linear inductor of claim 17 wherein the body comprises magnetic material tape wound into a toroid, wherein the laminations comprise portions of the tape, and wherein said core body is cut in a radial direction to produce said air gap, said air gap having a first width step portion being disposed adjacent the outer edge of said toroidal-core toroid and a the second width step portion

being disposed adjacent the inner edge of said ~~toroidal-core~~ toroid.

Claim 21 (Currently Amended): The non-linear conductor of claim ~~17~~ 20 wherein said first width is greater than said second width.

Claim 22 (New): The non-linear conductor of claim 17, wherein the air gap further comprises a third step portion having the first width, and wherein said second step portion is disposed between the first and third step portions.

Claim 23 (New): The non-linear conductor of claim 22, wherein the second step portion of the air gap is located midway along the depth of the first section in the stacking direction.

Claim 24 (New): The non-linear conductor of claim 23, wherein the first width is greater than the second width.

Claim 25 (New): The non-linear conductor of claim 22, wherein the second step portion of the air gap extends the entire depth of the first section in the stacking direction.

Claim 26 (New): The non-linear conductor of claim 25, wherein the body comprises magnetic material tape wound into a toroid and wherein the laminations comprise portions of the tape.

Claim 27 (New): The non-linear conductor of claim 22, wherein the laminations of the first section comprise first laminations and the stack comprises a first stack, said first laminations each having a first leg with an edge and at least one other leg, said first legs forming a first leg portion of the first stack and said at least one other legs forming at least one other leg portion of the first stack, said first leg portion having the stepped end, which is formed by the edges of the first legs; and

wherein the second section comprises a stack of second laminations, said second stack of second laminations being disposed adjacent to the first stack of first laminations to form a flow path for magnetic flux, said first leg portion of the first stack

and said second stack cooperating to create the air gap between the stepped end of the first leg portion of the first stack and said second stack, said air gap being configured to produce a desired non-linear inductance characteristic for said non-linear inductor.

Claim 28 (New): The non-linear conductor of claim 27, wherein the first laminations in the first stack are arranged in first, second and third groups, wherein the first laminations in the first and third groups each have a first predetermined length for the first leg, and the first laminations in the second group each have a second predetermined length for the first leg, said first and second predetermined lengths being different, and wherein the difference in lengths between the first and second predetermined lengths offsets the edges of the first legs in the first and third groups from the edges of the first legs in the second group, thereby forming the stepped end and the first, second and third step portions of the air gap.

Claim 29 (New): The non-linear conductor of claim 17, wherein the laminations of the first section comprise first laminations and the stack comprises a first stack, said first laminations each having the same predetermined shape and including a leg with a stepped edge, said legs of the first laminations forming a leg portion of the first stack;

wherein the second section comprises a stack of second laminations, said second stack of second laminations being disposed adjacent to the first stack of first laminations to form a flow path for magnetic flux, said leg portion of the first stack and said second stack cooperating to create the air gap between the stepped edges of the legs in the leg portion of the first stack and said second stack, said air gap being configured to produce a desired non-linear inductance characteristic for said non-linear inductor; and

wherein the stepped edges are aligned, thereby forming the stepped end and the first and second step portions of the air gap.

Claim 30 (New): The non-linear inductor of claim 29, wherein each of the first laminations is E-shaped and includes a center leg disposed between a pair of end legs, said center leg being the leg with the stepped edge;

wherein the first stack comprises a center leg portion disposed between a pair of

end leg portions, said center leg portion being the leg portion of the first stack that cooperates with the second stack to form the air gap;

and wherein the first and second portions of the air gap are arranged adjacent to each other in the direction between the end leg portions of the first stack.

Claim 31 (New): The non-linear inductor of claim 11, wherein the first laminations each have the same predetermined shape;

wherein the edge of the first leg is stepped; and

wherein the stepped edges of the first legs are aligned, thereby providing the end of the first leg portion with a stepped contour and providing the air gap with first and second step portions having first and second widths, respectively, said first and second widths being different.

Claim 32 (New): The non-linear inductor of claim 31, wherein each of the first laminations is E-shaped and includes a center leg disposed between a pair of end legs, said center leg being the leg with the stepped edge;

wherein the first stack comprises a center leg portion disposed between a pair of end leg portions, said center leg portion being the leg portion of the first stack that cooperates with the second stack to form the air gap; and

wherein the first and second portions of the air gap are arranged adjacent to each other in the direction between the end leg portions of the first stack.

Claim 33 (New): The non-linear inductor of claim 12, wherein the first stack comprises a center leg portion disposed between a pair of end leg portions, said center leg portion being the first leg portion of the first stack and said end leg portions being the at least one other leg portion; and

wherein each of the second laminations is I-shaped, and wherein end portions of the second stack adjoin the end leg portions of the first stack, respectively.

Claim 34 (New): The non-linear inductor of claim 33, wherein the air gap extends uninterrupted between the center leg portion of the first stack and the second stack for the entire width of the center leg portion of the first stack.